Stoller
Grand Junction Office established 1959

299-W19-07 (A7735)
Log Data Report

Borehole Information:

Borehole:	299-W19-07 (A7735)		Site:	216-S-23 Crib	
Coordinates (WA St Plane)		GWL[1] (ft) :	None	GWL Date:	07/09/03
North	East	Drill Date	TOC[2] Elevation (ft)	Total Depth (ft)	Type
134464.315 m	567617.274 m	11/68	692.48	235	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	2.6	6 5/8	6	5/16	2.6	unknown

Borehole Notes:

The logging engineer measured the casing stickup using a steel tape. A caliper was used to measure the outside casing diameter. The caliper and inside casing diameter were measured using a steel tape, rounded to the nearest 1/16 in.; casing thickness was calculated. Total depth (235 ft) is derived from Ledgerwood (1993). Total logging depth was 221 ft. Ledgerwood (1993) reported the casing was perforated from 205 to 233 ft and that the borehole was filled to 219 ft. The logging engineer reported no water in the borehole. Coordinates and top of casing (TOC) elevation are derived from HWIS[3]. Logging data acquisition is referenced to the TOC.

Logging Equipment Information:

Logging System:	Gamma 2E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	03/03	Calibration Reference:	GJO-2003-430-TAC	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	3		
Date	07/08/03	07/09/03	07/09/03		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	221.0	153.0	132.0		
Finish Depth (ft)	131.0	131.0	3.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	1.0		
ft/min	N/A[4]	N/A	N/A		
Pre-Verification	BE056CAB	BE057CAB	BE057CAB		
Start File	BE056000	BE057000	BE057023		
Finish File	BE056090	BE057022	BE057150		

Log Run	1	2 Repeat	3		
Post-Verification	BE056CAA	*None	*None		
Depth Return Error (in.)	-1	N/A	0		
Comments	No fine-gain adjustment.	*No signal from sonde after logging completed. No fine-gain adjustment.	*No signal from sonde after logging completed. Fine-gain adjustment after files -066, -108, and -135.		

Logging Operation Notes:

Spectral gamma logging was performed in this borehole on July 7 and 9, 2003. Logging was conducted with a centralizer on the sonde and measurements are referenced to TOC. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	07/21/03	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met except for post-verification file number BE056CAA (log run 1). The net count rate for the 2615-keV energy peak was 33.5 percent lower at the end of the day's logging as compared to the pre-verification file number BE056CAB. This discrepancy suggests a loss of efficiency at the higher energy peaks that would result in lower calculated concentrations for ^{232}Th. However, examination of spectra for log run 1 (221 to 131 ft) indicated normal peaks and concentrations; therefore, these spectra are provisionally accepted. After logging was completed July 9 (log runs 2 and 3), the sonde failed before a post-verification measurement could be collected. Spectra were checked and appeared to be normal. A repeat section was also acquired, indicating satisfactory performance. The logging sonde was taken out of service to diagnose potential problems.

A casing correction for 0.3125-in.-thick casing was applied throughout the borehole.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G2EMar03.xls using an efficiency function determined from annual calibrations. Dead time and water corrections were not necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. A repeat log section is included. A historical gross gamma log (Fecht et al. 1977) is also presented.

Results and Interpretations:

^{137}Cs was the man-made radionuclide detected in this borehole. ^{137}Cs was detected at a few sporadic locations in the borehole near its MDL of approximately 0.2 pCi/g. The historical gross gamma log from Fecht et al. (1977) (attached) indicates background gamma activity in 1976, which is consistent with the current SGLS log.

The repeat section indicated good agreement of the naturally occurring KUT.

References:

Fecht, K.R., G.V. Last, and K.R. Price, 1977. *Evaluation of Scintillation Probe Profiles from 200 Area Crib Monitoring Wells*, ARH-ST-156, Atlantic Richfield Hanford Company, Richland, Washington.

Ledgerwood, R.K., 1993. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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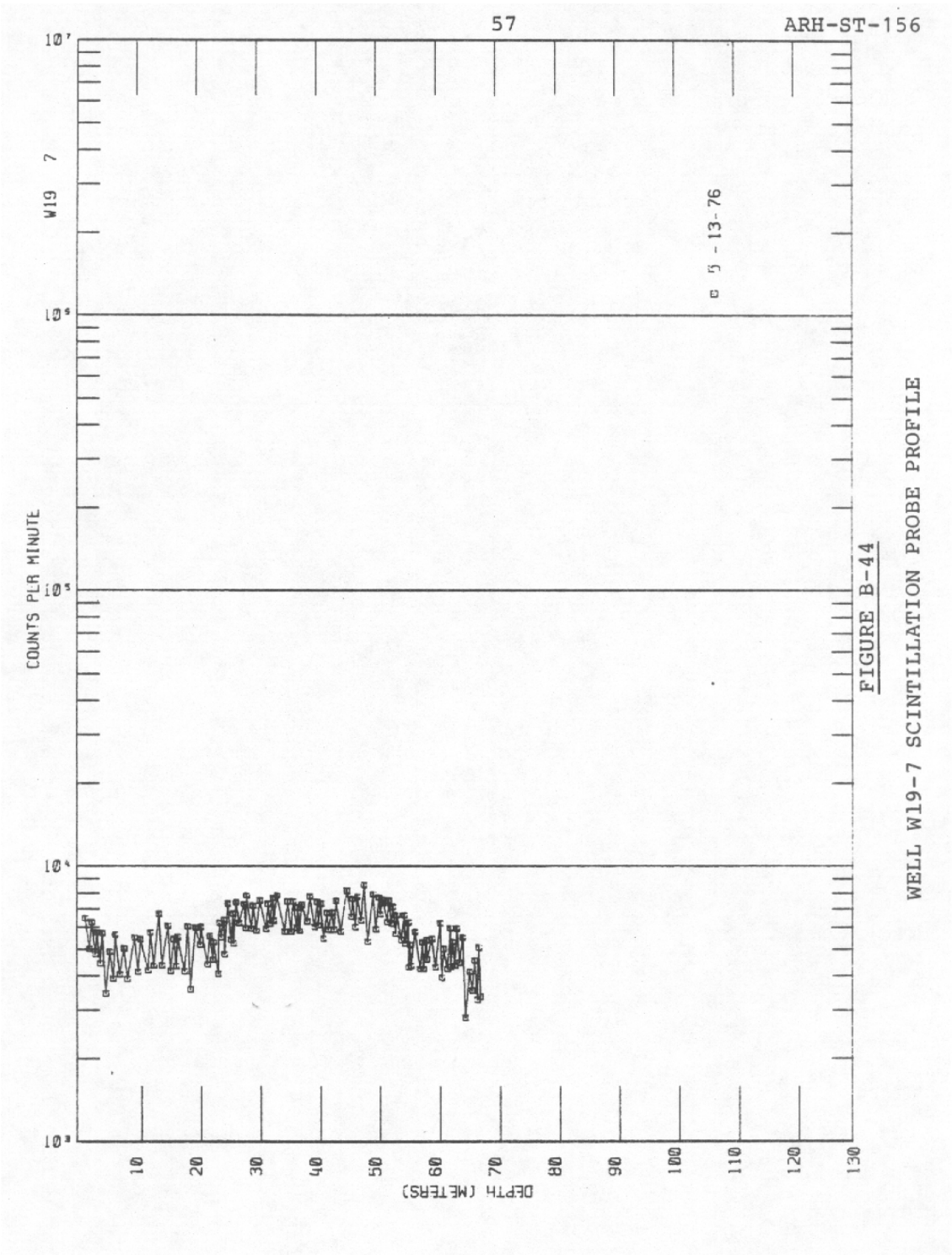
[1] GWL – groundwater level
[2] TOC – top of casing
[3] HWIS – Hanford Well Information System
[4] N/A – not applicable

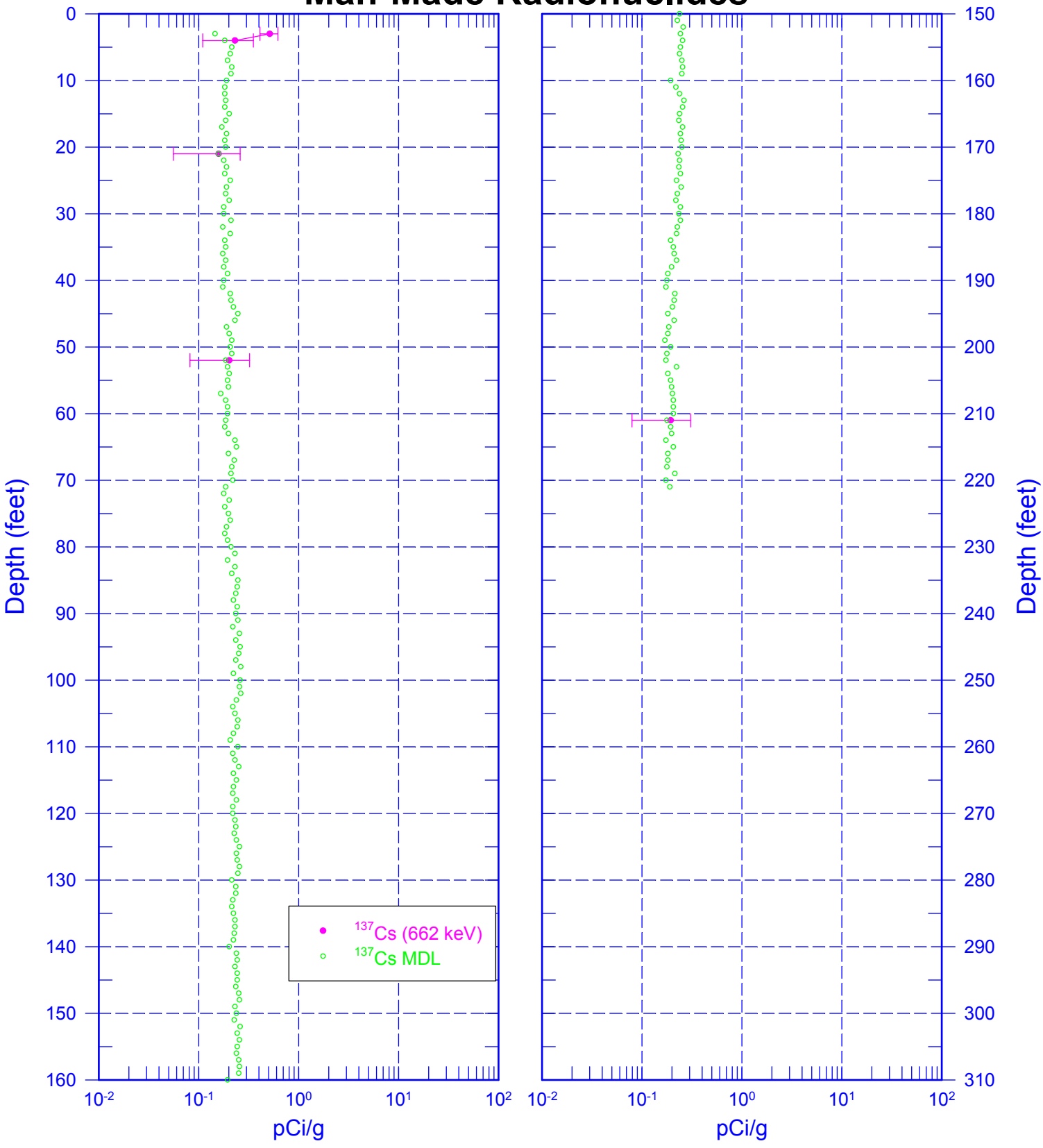


from Fecht et al. (1977)

Scintillation Probe Profiles for Borehole 299-W19-07, Logged on 5/13/76

299-W19-07 (A7735)

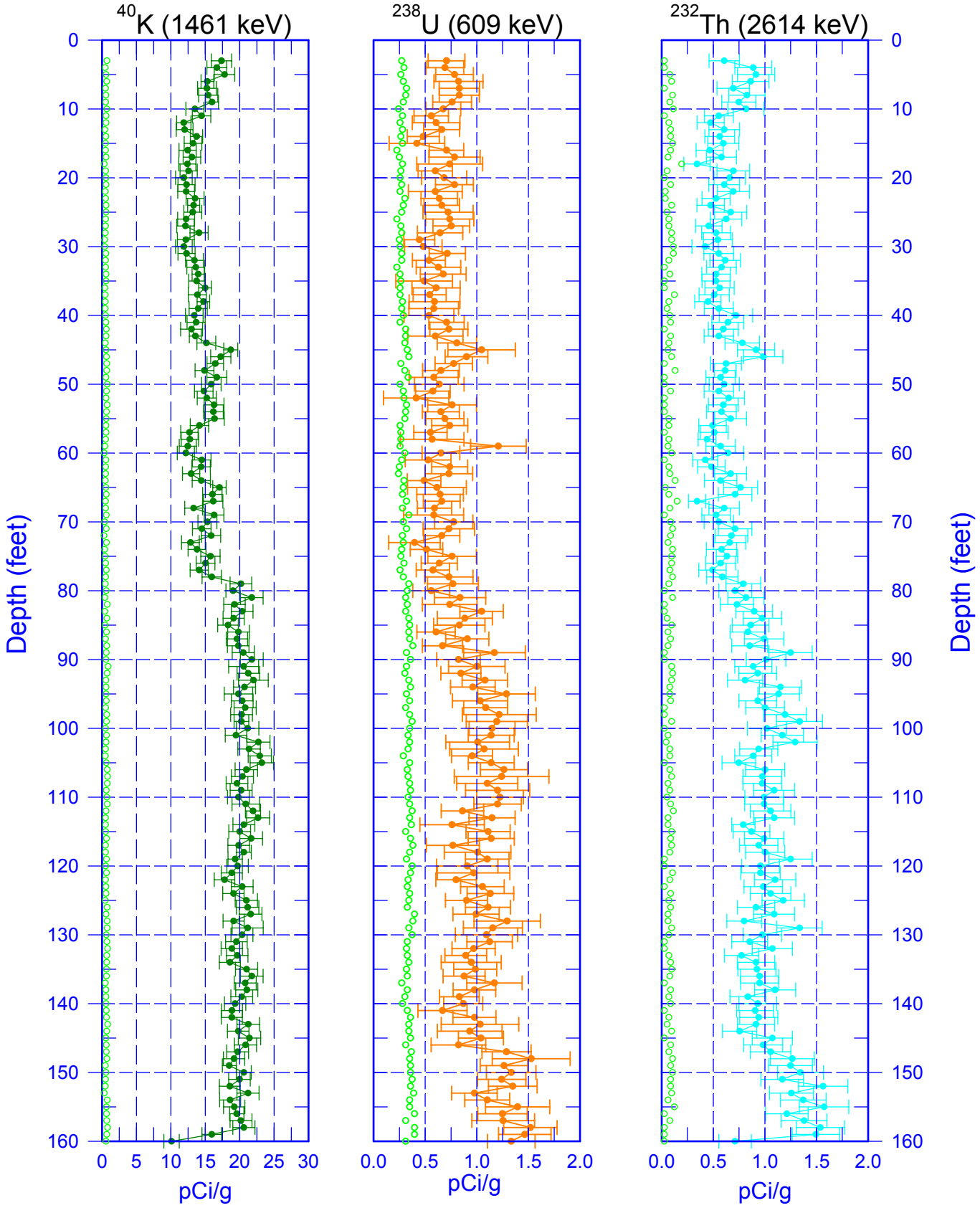
Man-Made Radionuclides



Zero Reference - Top of Casing

Last Log Date - 07/09/03

299-W19-07 (A7735)
Natural Gamma Logs

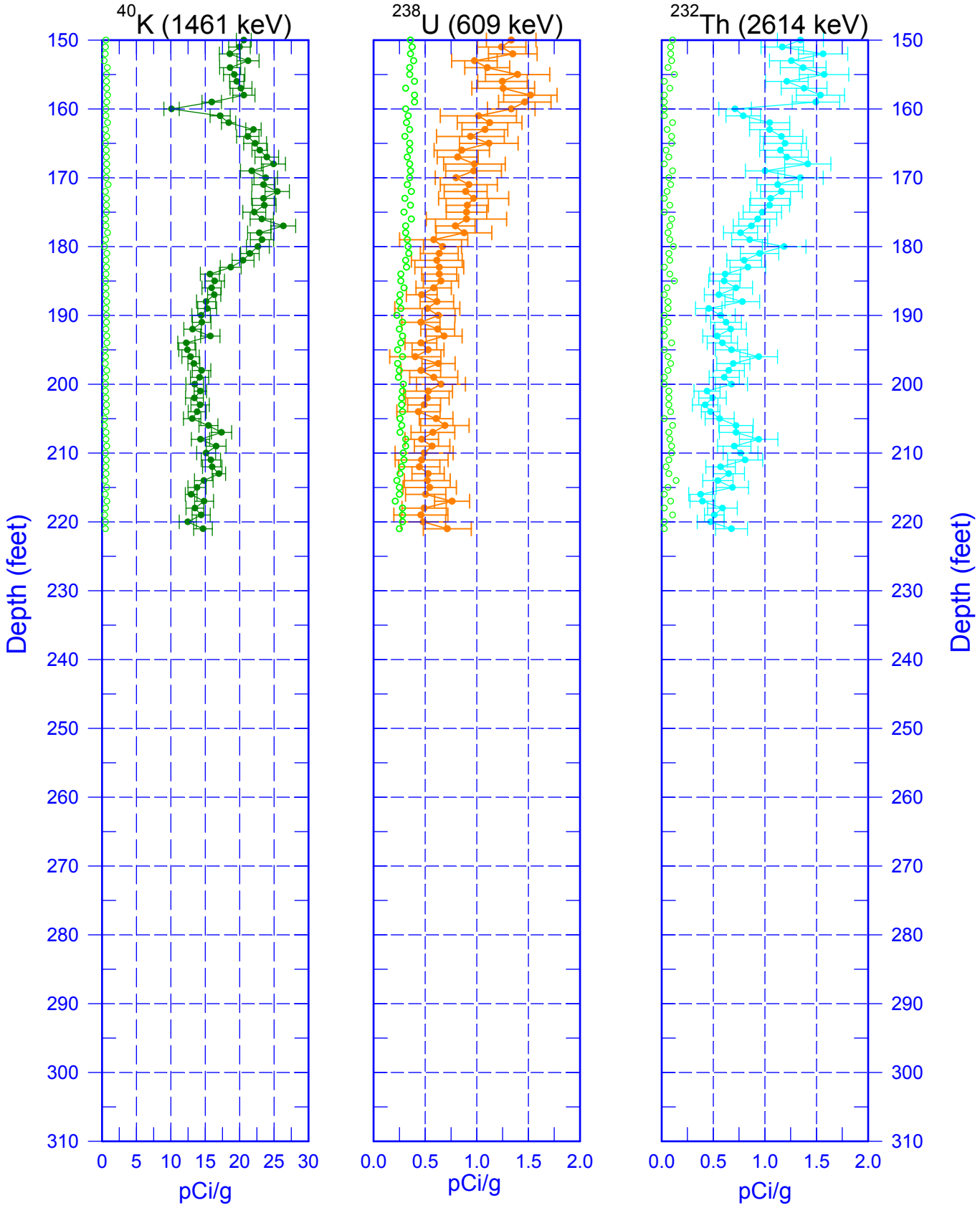


Zero Reference = Top of Casing

MDL

Last Log Date - 07/09/03

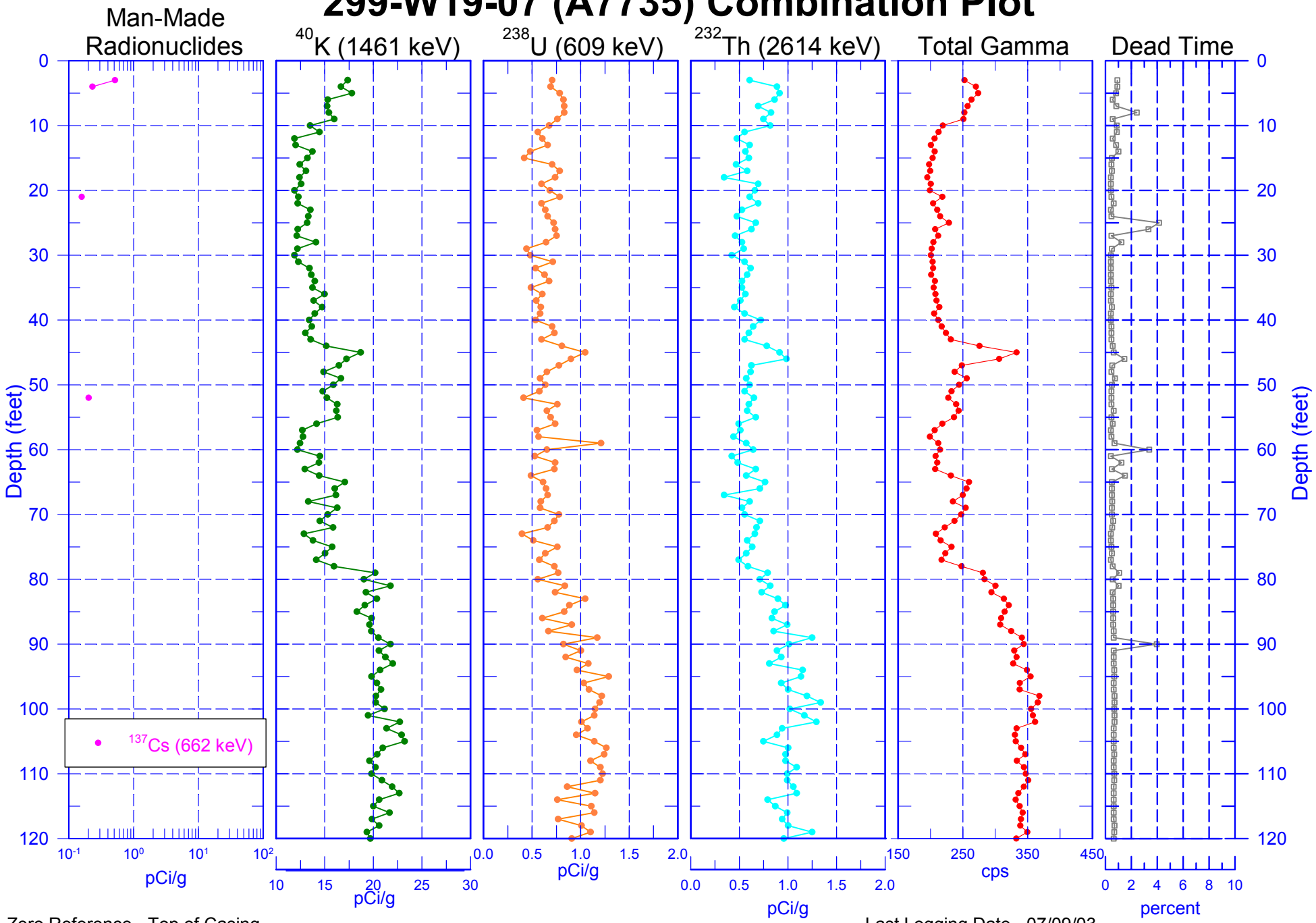
299-W19-07 (A7735)
Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 07/09/03

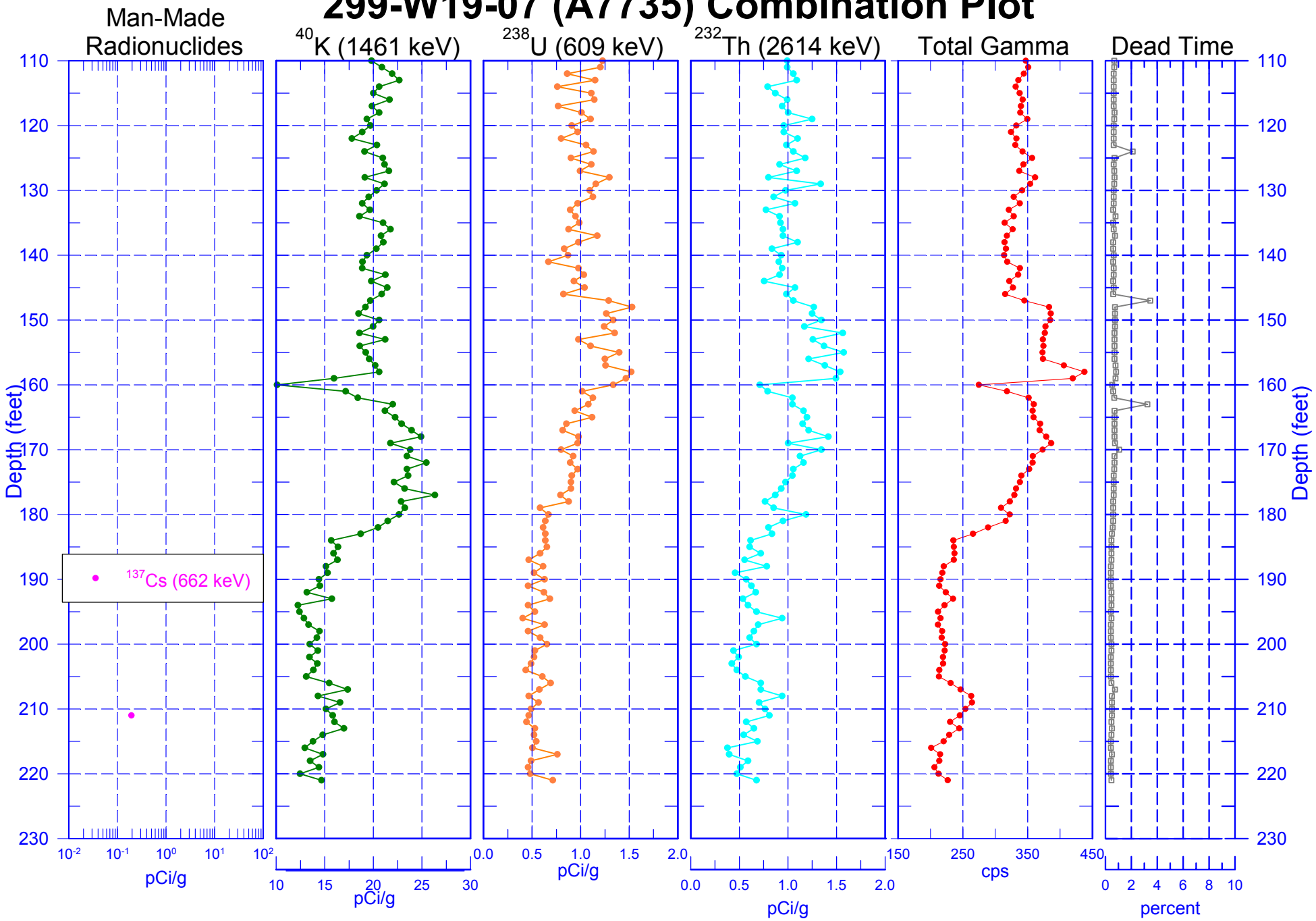
299-W19-07 (A7735) Combination Plot



Zero Reference - Top of Casing

Last Logging Date - 07/09/03

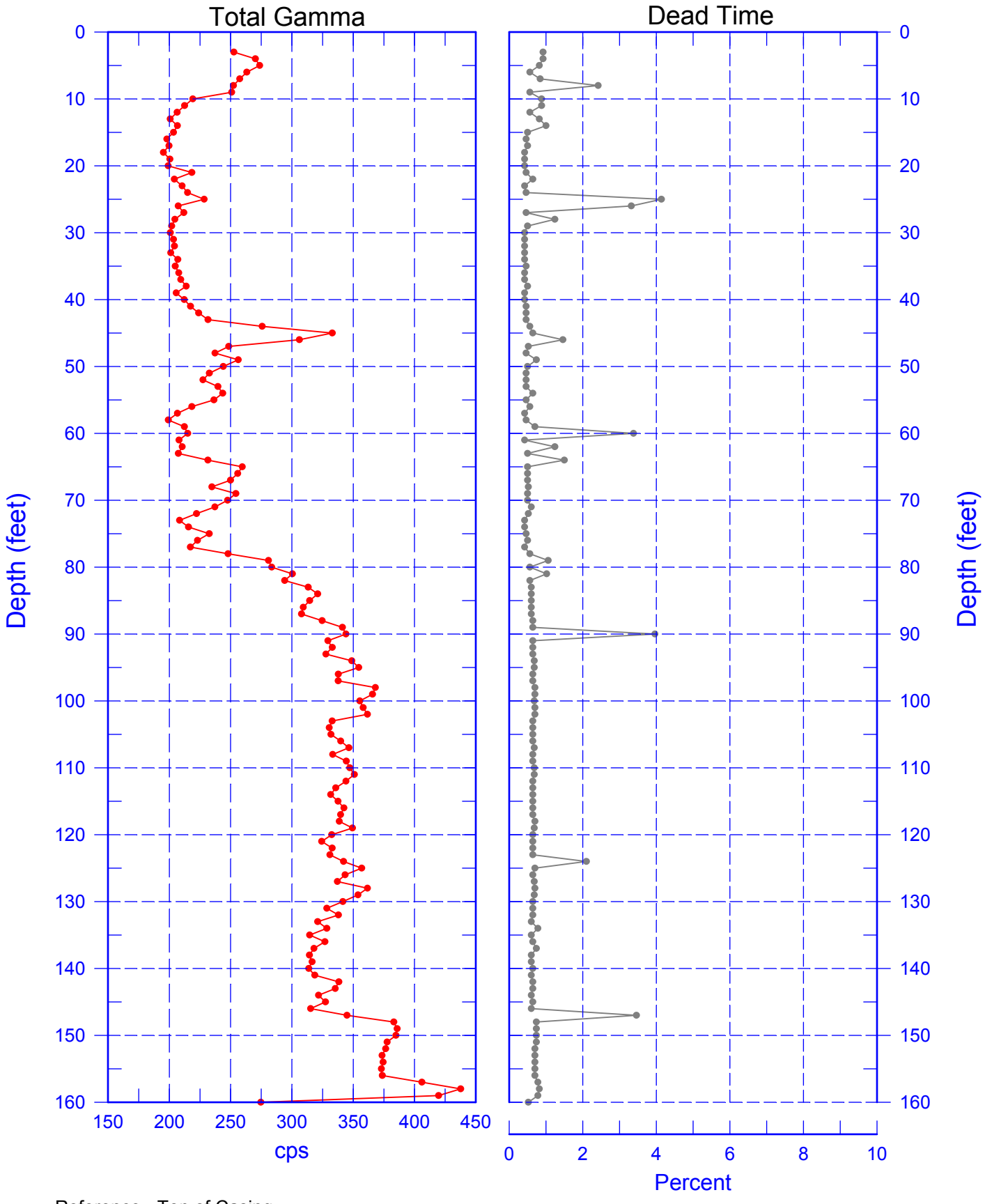
299-W19-07 (A7735) Combination Plot



Zero Reference - Top of Casing

Last Logging Date - 07/09/03

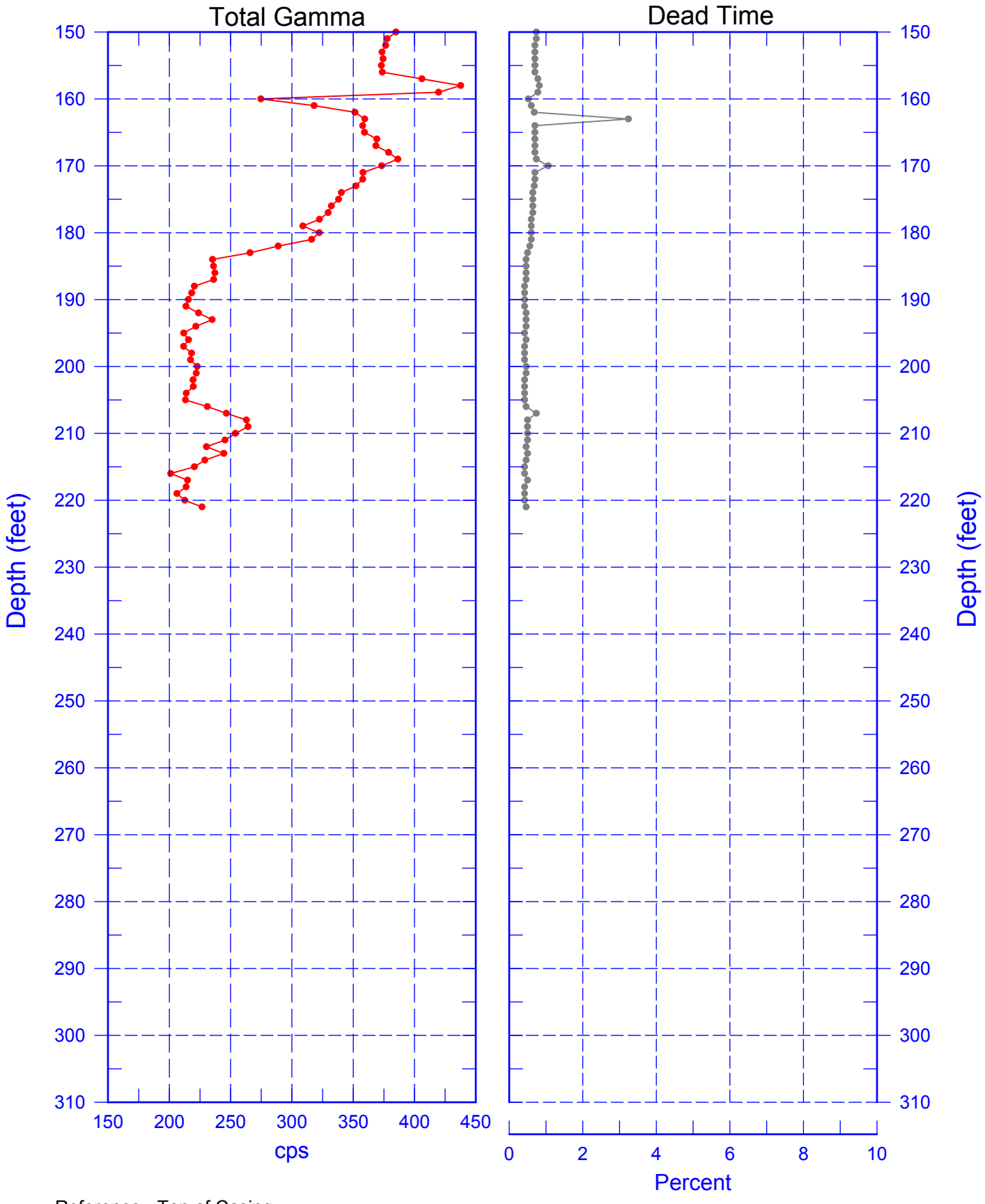
299-W19-07 (A7735)
Total Gamma & Dead Time



Reference - Top of Casing

Last Log Date - 07/09/03

299-W19-07 (A7735)
Total Gamma & Dead Time

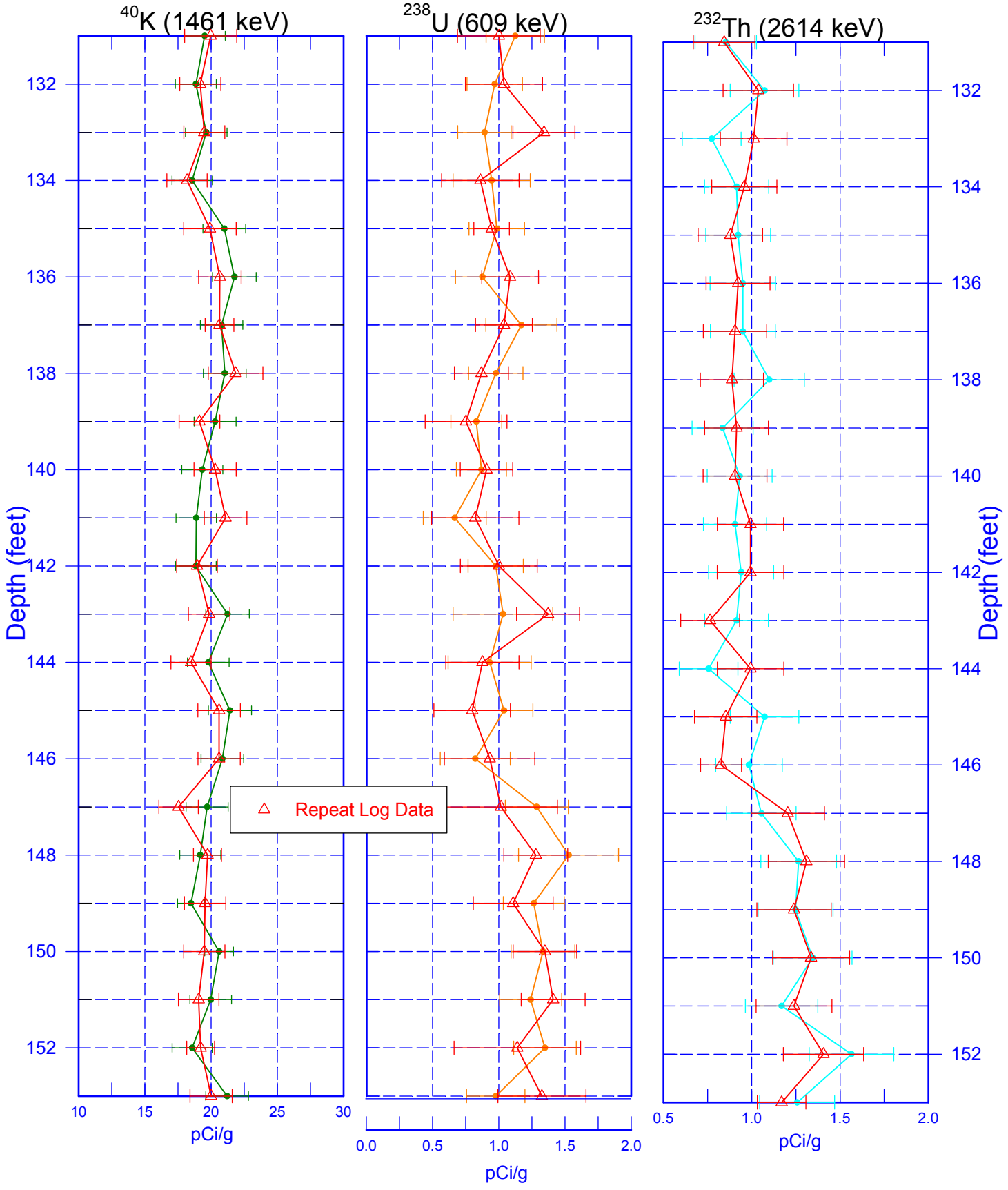


Reference - Top of Casing

Last Log Date - 07/09/03

299-W19-07 (A7735)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 07/09/03